

**Notice of Allowability**

Application No.

10/091,841

Examiner

Juliet C. Switzer

Applicant(s)

CHO ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 6/9/04 and interview 6/23/04.
2. ☒ The allowed claim(s) is/are 29-36, 38-46, 65-68, 73-85 and 87-94.
3. ☒ The drawings filed on 3/5/02 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 0604.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Otis Littlefield on 6/23/04.

The application has been amended as follows:

Claims 69 and 86 have been cancelled.

The following claims have been replaced with the amended claims as below.

Claim 36. A transgenic plant comprising a recombinant nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid that hybridizes to SEQ ID NO:10 under hybridization conditions that include at least one wash in 0.1 X SSC at 65°C.

Claim 38. A transgenic plant of claim 36 wherein said recombinant nucleic acid is operably linked to a transcriptional regulatory sequence active in said plant.

Claim 39. The transgenic plant of claim 38 wherein said transcriptional regulatory sequence is active in a seed cell.

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Claim 40. A transgenic seed comprising a transcriptional regulatory sequence active in said seed operably linked to a recombinant nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid that hybridizes to SEQ ID NO:10 under hybridization conditions that include at least one wash in 0.1 X SSC at 65°C.

Claim 45. A method of expressing an NTR protein comprising culturing the transgenic seed of claim 40 under conditions suitable for expression of said NTR protein.

Claim 65. An isolated nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid that hybridizes to SEQ ID NO:10 under hybridization conditions that include at least one wash in 0.1 X SSC at 65°C.

Claim 79. A transgenic plant comprising a recombinant nucleic acid comprising SEQ ID NO:10.

Claim 80. A transgenic plant comprising a recombinant nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid having at least 95% sequence identity to SEQ ID NO:10.

Claim 81. A transgenic plant comprising a recombinant nucleic acid encoding SEQ ID NO: 9.

Claim 82. The transgenic plant of claim 79 wherein the recombinant nucleic acid is operably linked to a transcriptional regulatory sequence active in said plant.

Claim 83. The transgenic plant of claim 80 wherein the recombinant nucleic acid is operably linked to a transcriptional regulatory sequence active in said plant.

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Claim 84. The transgenic plant of claim 81 wherein the recombinant nucleic acid is operably linked to a transcriptional regulatory sequence active in said plant.

Claim 85. A transgenic plant comprising a host cell comprising an expression vector comprising a transcriptional regulatory sequence active in said cell operably linked to a recombinant nucleic acid comprising SEQ ID NO:10.

Claim 87. A transgenic plant comprising a host cell comprising an expression vector comprising a transcriptional regulatory sequence active in said cell operably linked to a recombinant nucleic acid encoding SEQ ID NO: 9.

Claim 88. A transgenic seed comprising a transcriptional regulatory sequence active in said seed operably linked to a recombinant nucleic acid comprising SEQ ID NO: 10.

Claim 89. A transgenic seed comprising a transcriptional regulatory sequence active in said seed operably linked to a recombinant nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid having at least 95% sequence identity to SEQ ID NO: 10.

Claim 90. A transgenic seed comprising a transcriptional regulatory sequence active in said seed operably linked to a recombinant nucleic acid.

2. All outstanding objections and rejections of claims 37, 69, 70, and 86 are moot in view of the cancellation of these claims.

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3. All previously set forth claim objections are withdrawn in view of the amendments to the claims.

4. The rejection of claims 36, 38, 39, 40, 43, 44, 45, 79, 80, 81, 82, 83, 84, 85, 87, 88, 89, 90, 92, 93, and 94 under 35 U.S.C. 112, second paragraph set forth in the final office action is withdrawn in view of the amendments to the claims.

5. The rejection of claims 29, 31, 33-36, 38-46, 65, 67, 74, 77, 80, 83, 89, and 91-94 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement set forth in the final office action is withdrawn in view of the amendments to the claims which set forth a clear relevant identifying characteristics, namely a functional characteristics coupled with a known or disclosed correlation between function and structure sufficient to describe the claimed invention in such full, clear, concise and exact terms that a skilled artisan would recognize applicant was in possession of the claimed invention. In addition to the amendments to the claims, it is further noted that Dai *et al.* (1996, J. Mol. Biol.; cited in IDS) provide an alignment of fourteen different thioredoxin reductase molecules and identifies active sites, conserved residues and structural motifs common to these molecules (p. 1051, Figure 6).

6. The rejection of claims 29, 31, 33-36, 38-46, 65, 67, 74, 77, 80, 83, 89, and 91-94 under 35 U.S.C. 112, first paragraph for scope of enablement is withdrawn in view of the amendments to the claims, applicant's arguments concerning the level of skill in the art (p. 16 of the response), and in view of the disclosure of Dei *et al.*, in particular who provide an alignment of

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fourteen different thioredoxin reductase molecules and identifies active sites, conserved residues and structural motifs common to these molecules (p. 1051, Figure 6).

7. The rejection of claims 29, 33-35, 41-42, 46, 65, and 91 under 35 U.S.C. 102(e) as being anticipated by Lalgudi *et al.* (US 6476212) is withdrawn in view of the amendment to the claims which requires that the claimed nucleic acids encode a protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation, and in view of the declaration filed 12/29/03, particularly ¶6 of the declaration.

8. The rejection of claims 36, 38, 39, 40, 43, 44, 45, 79, 80, 82, 83, 84, 85, 87, 88, 89, 90, 92, 93, and 94 under 35 U.S.C. 103(a) as being unpatentable over Jacquot *et al.* in view of Shi *et al.* is withdrawn in view of the amendments in this examiner's amendment wherein independent claims 36, 40, 79, 80, 81, 89, and 90 are amended to remove the recitation of nucleic acids SEQ ID NO: 26 and 27 and nucleic acids encoding SEQ ID NO: 24 and SEQ ID NO: 25.

9. The following is an examiner's statement of reasons for allowance:

All previous rejections being withdrawn, the claims are allowed. The claims are free of the prior art because the prior art does not teach or suggest a recombinant or isolated nucleic acid encoding an NTR protein that catalyzes the reduction of thioredoxin coupled to NADPH<sub>2</sub> oxidation comprising a nucleic acid that hybridizes to SEQ ID NO: 10 under hybridization conditions that include at least one wash in 0.1 X SSC at 65°C, or such a molecule having at least

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95% sequence identity to SEQ ID NO: 10. Each of the products and methods claimed in the instant application require one of these molecules.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliet C Switzer whose telephone number is (571) 272-0753. The examiner can normally be reached on Monday through Friday, from 9:00 AM until 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached by calling (571) 272-0782.


The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-0507.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

  
Juliet C. Switzer  
Examiner  
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June 24, 2004